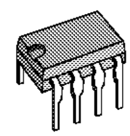
SGS-THOMSON MICROELECTRONICS

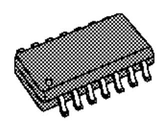
TDE1747
TDF1747

INTERFACE CIRCUIT – RELAY AND LAMP – DRIVER

- OPEN GROUND PROTECTION
- HIGH OUTPUT CURRENT
- ADJUSTABLE SHORT-CIRCUIT PROTECTION TO GROUND
- THERMAL PROTECTION WITH HYSTERESIS TO AVOID THE INTERMEDIATE OUTPUT LEVELS
- LARGE SUPPLY VOLTAGE RANGE : + 10 V TO + 45 V
- SHORT-CIRCUIT PROTECTION TO V_{CC}



Minidip (DP)



SO14 (FP)

ORDERING NUMBERS:
TDE1747DP
TDE1747FP
TDF1747DP

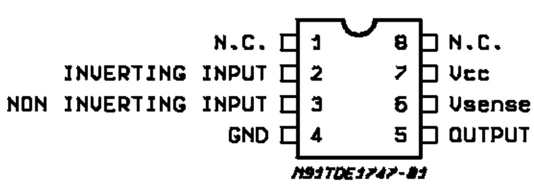
DESCRIPTION

The TDE/TDF1747 is a monolithic comparator designed for high current and high voltage applications, specifically to drive lamps, relays, stepping motors.

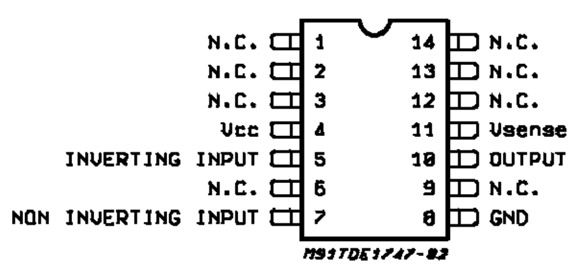
These device is essentially blow-out proof. Current limiting is available to limit the peak output current to safe values, the adjustment only requires one external resistor. In addition, thermal shut down is provided to keep the I.C. from overheating. If internals dissipation becomes too great, the driver will shut down to prevent excessive heating. TDE1747 has an open ground protection. The output is also protected from short-circuits with the positive power supply.

The device operates over a wide range of supply voltages from standard ± 15 V operational amplifier supplies down to the single + 12 V or + 24 used for industrial electronic systems.

PIN CONNECTIONS (Top view)



Minidip



SO14

ABSOLUTE MAXIMUM RATINGS

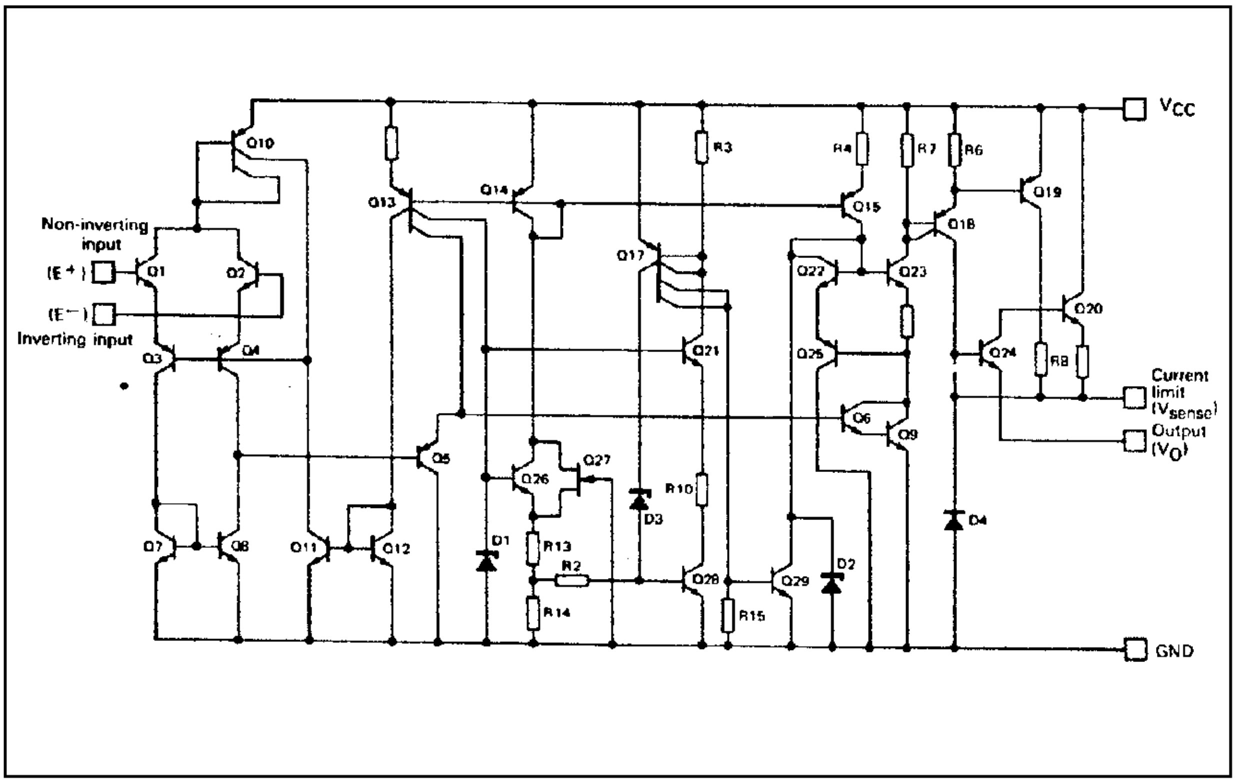
Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	50 *	V
V_{ID}	Differantial Input Voltage	50	V
V_I	Input Voltage	50	V
I_O	Output Current	1	A
P_{tot}	Power Dissipation (T_{amb} = + 25 °C)	Internally Limited	W
T_{stg}	Storage Temperature Range	– 65 to + 150	°C
T_{oper}	Operating Ambient Temperature Range TDE1747 TDF1747	 – 25 to + 85 – 40 to + 85	 °C °C

(*) 60V, t â 10ms

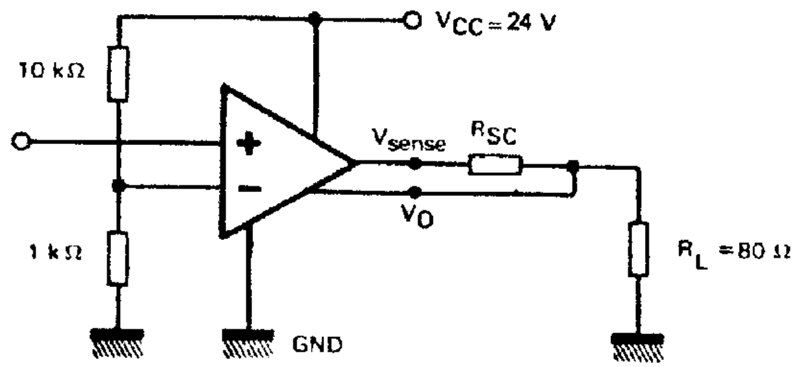
THERMAL CHARACTERISTICS

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Maximum Junction-case Thermal Resistance	50	°C/W
$R_{th(j-a)}$	Maximum Junction-ambient Thermal Resistance	120	°C/W
R_{th}	Junction-ceramic Substrate (case glued to substrate) SO14	90	°C/W
R_{th}	Junction-ceramic Substrate (case glued to substrate, substrate temperature maintened constant) SO14	65	°C/W

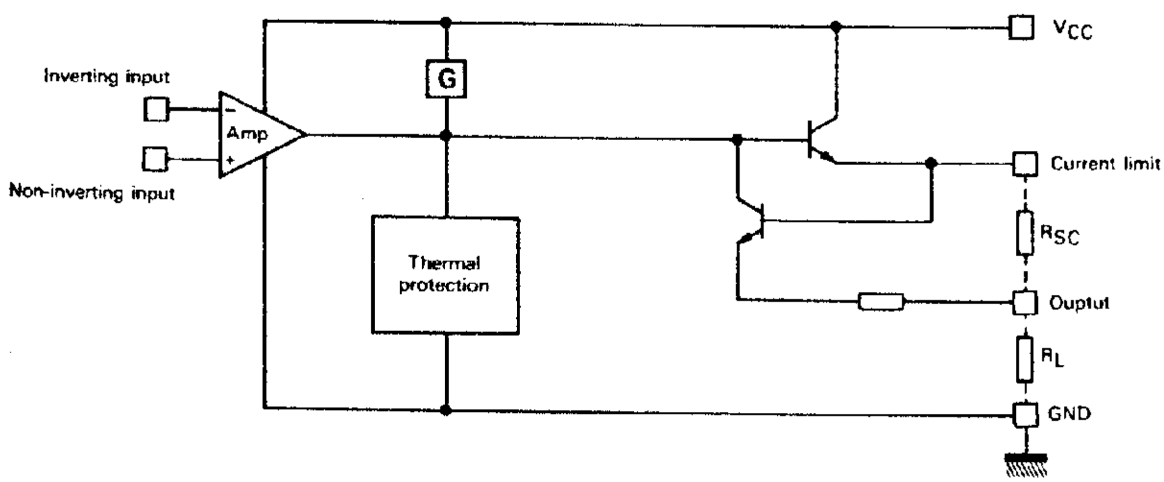
SCHEMATIC DIAGRAM



TEST CIRCUIT



SIMPLIFIED CIRCUIT



ELECTRICAL CHARACTERISTICS T_j = – 25 to +85 °C, V_{CC} = 8 to 45 V, unless otherwise specified (note 1).

Symbol	Parameter	Min.	Typ.	Max.	Unit
V_{IO}	Input Offset Voltage - (note 2)	–	2	50	mV
I_{IB}	Input Bias Current	–	0.1	1.5	mA
I_{CC}	Supply Current (V_{CC} = + 24 V, I_O = 0) High Level Low Level	 – –	 4 2	 6 4	 mA mA
$V_{I(max)}$	Common-mode Input Voltage Range	2	–	V_{CC}–2	V
I_{SC}	Short-circuit Current Limit (T_{amb} = + 25 °C, V_{CC} = + 24) R_{SC} = 1.5 Ω TDE1747 R_{SC} = ∞	 – –	 480 35	 – 50	 mA mA
V_{CC}–V_O	Output Saturation Voltage (output high) (R_{SC} = 0, V_{I+}–V_{I-} ≥ 50 mV) I_O = 300 mA, T_j = + 25 °C T_j = + 150 °C	 – –	 1.15 1.05	 1.4 1.3	 V V
I_{OL}	Low Level Output Current (V_O = 0, V_{CC} = + 24 V) T_j = + 25 °C	 –	 0.01	 10	 µA

Notes :

1) For operating at high temperature, the TDE/TDF1747, must be derated based on a + 150 C maximum junction temperature and a junction-ambient thermal resistance of 120 °C/W for Minidip and 100 °C/W for the SO14.

2) The offset voltage given is the maximum value of input voltage required to drive the output voltage within 2 V of the ground or the supply voltage.

Figure 1: Available Output Current vs. Limiting Resistor

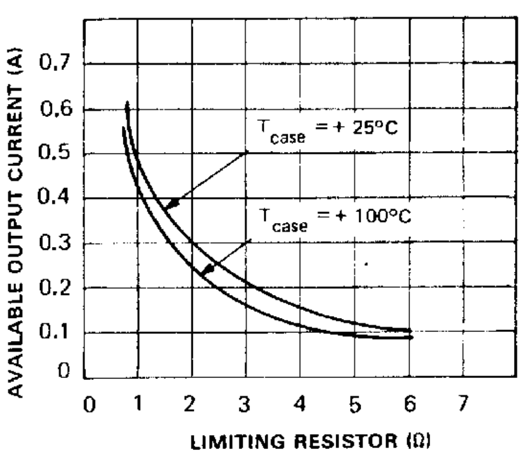


Figure 2: Peak Short-circuit Output Current vs. Limiting Resistor

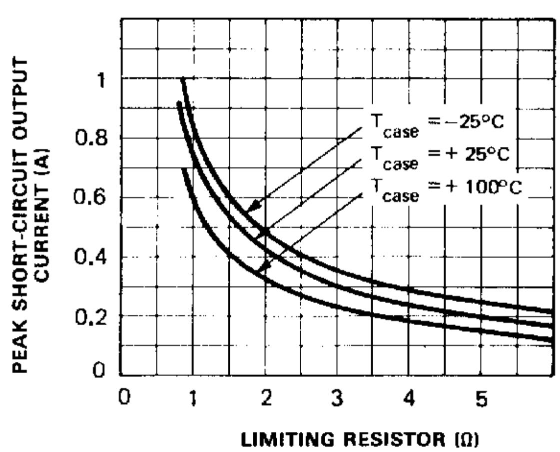


Figure 3: Short-circuit Current vs. Case Temperature

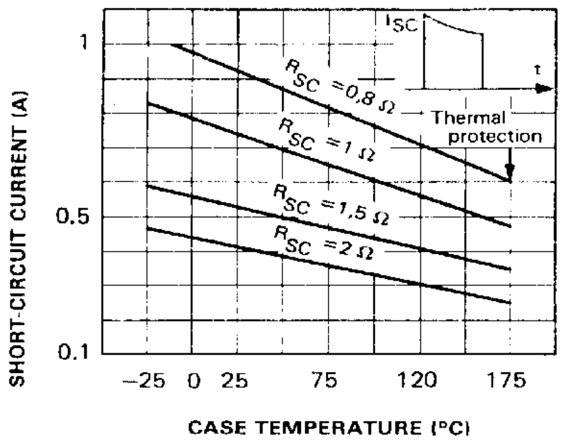


Figure 4: Minimum Limiting Resistor Value vs. Supply Voltage

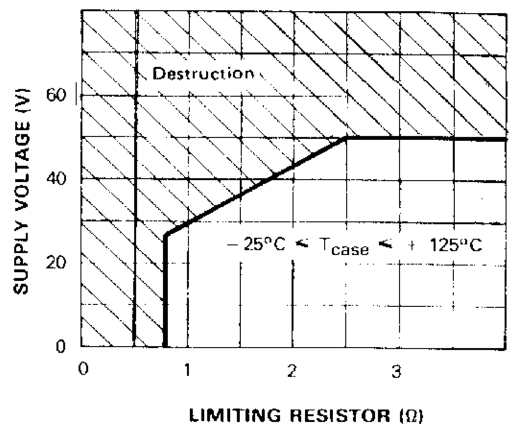


Figure 5: Output Current vs. Output Saturation Voltage

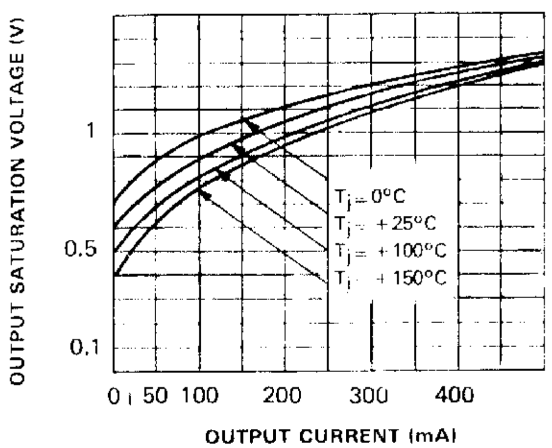


Figure 6: Supply Current vs. Supply Voltage

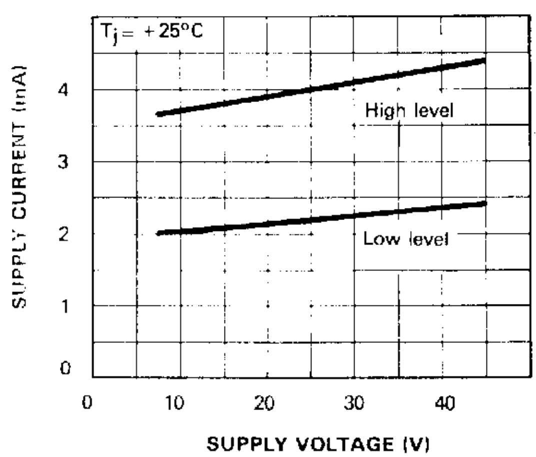


Figure 7: Supply Current vs. Junction Temperature

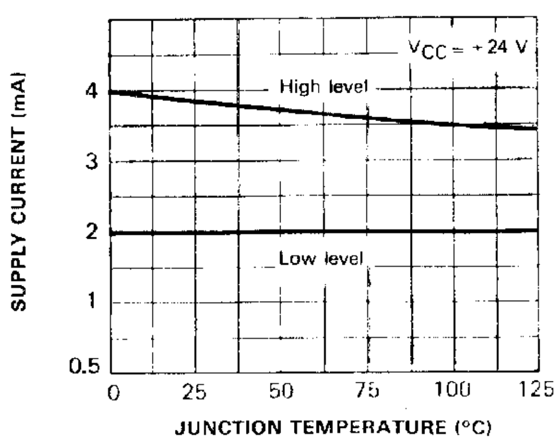


Figure 8: Safe Operating Area (non repetitive surge)

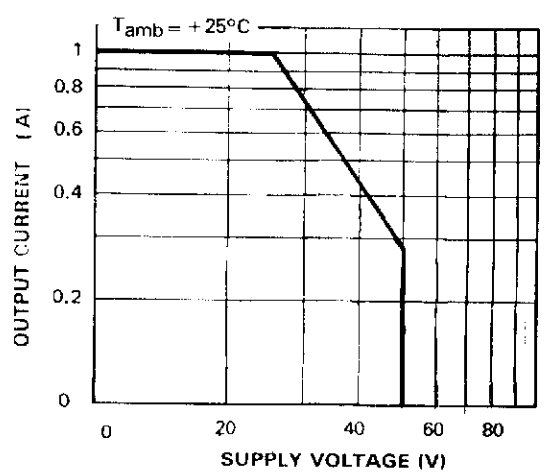
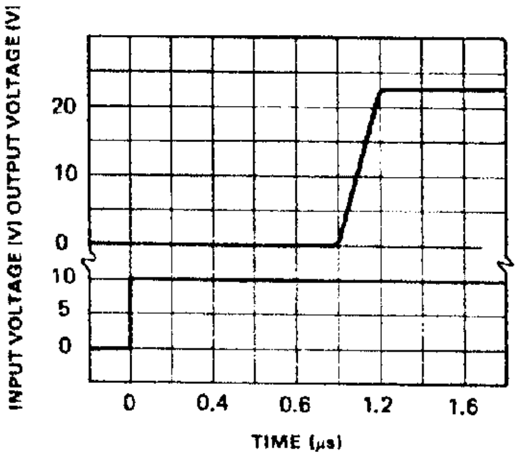
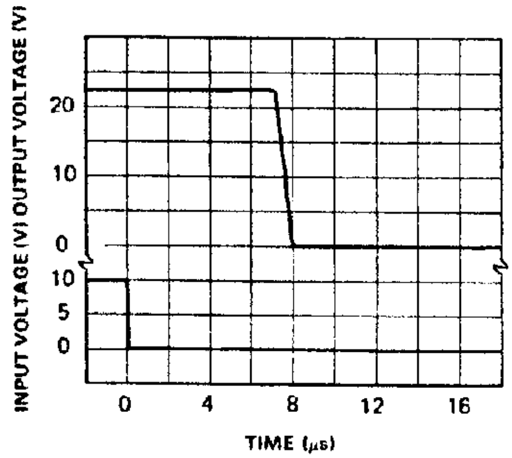


Figure 9: Response Time





TYPICAL APPLICATIONS

Figure 10: Base Circuit

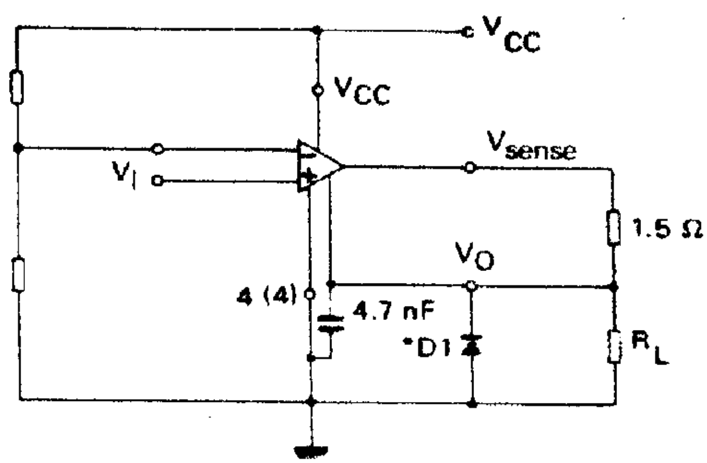


Figure 11: Output Current Extension (5A)

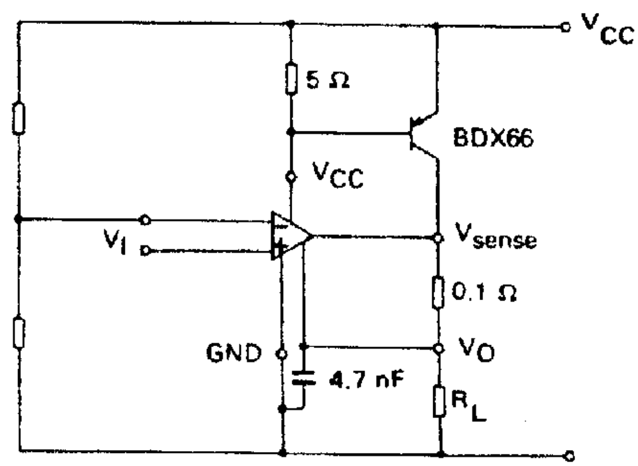
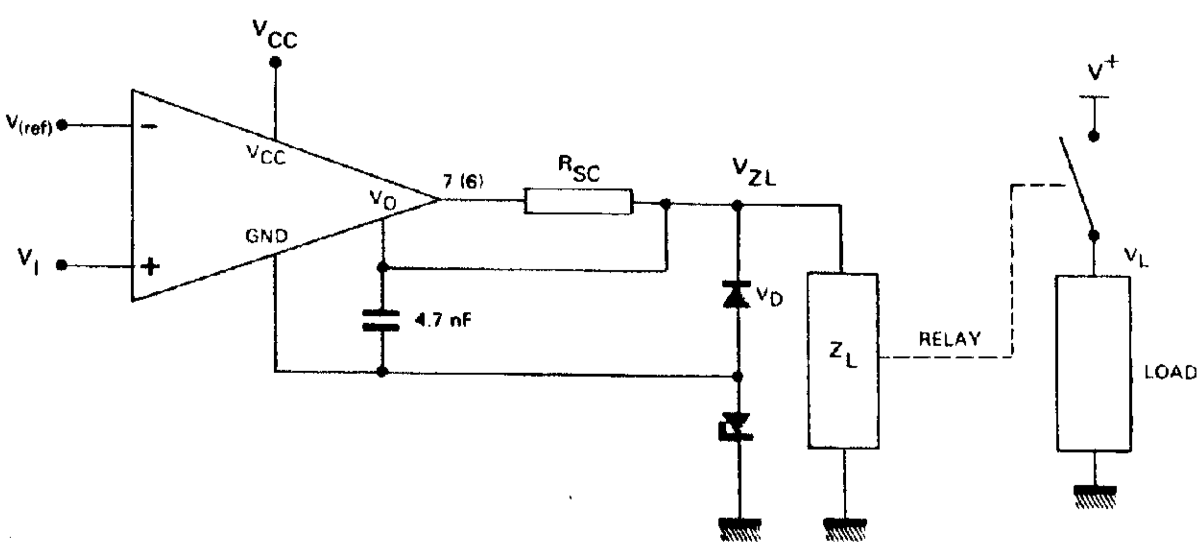
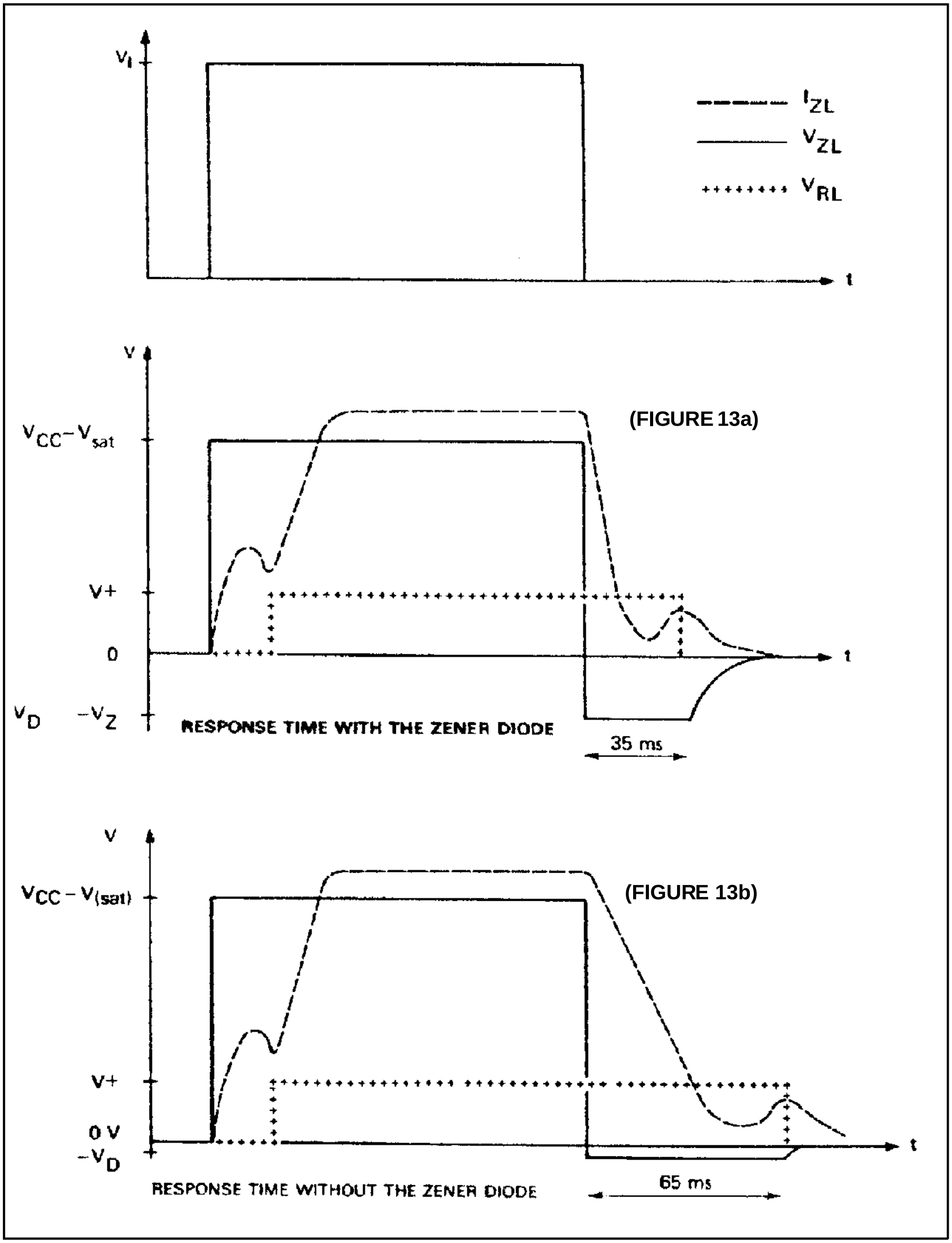


Figure 12: Driving Low Impedance Relays (I_O = 300mA)



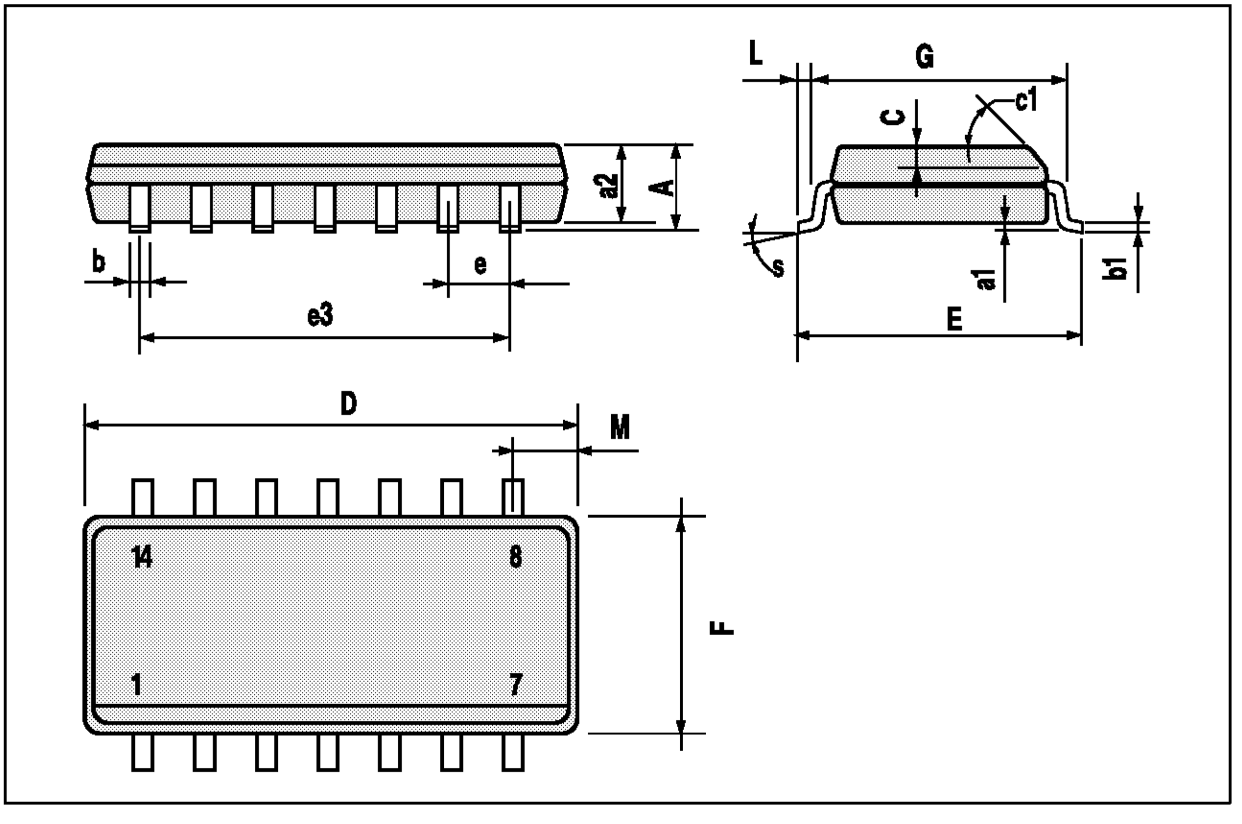
The device in the above application operates at: V_{CC} = +45V, I_O = 300mA with a heatsink such that $R_{th(j-a)} \leq$ 80°C/W. The device supports an output voltage of $V_{CC} = V_Z$ during the current cut off time, which is decreased by the zener diode. This voltage must be ≤ to the maximum supply voltage.

Figure 13: Waveforms



SO14 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.25	0.004		0.009
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.020	
c1	45 (typ.)					
D	8.55		8.75	0.336		0.344
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		7.62			0.300	
F	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.68			0.027
S	8 (max.)					



MINIDIP PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
I			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060

